

THE FUTURE OF DISEASE CONTROL AND PREVENTION WITH PARTICULAR REFERENCE TO REPLANTING

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At the outset I want to assure you that I am not introducing any new or alarming subject on this occasion. Having, at the last Conference, treated you to a very theoretical dissertation, I propose today to be strictly practical.

Continuing the emphasis on the future, it is my intention to deal with some of the opportunities, offered by replanting, to minimise losses through disease, and I propose to begin with root diseases.

The beneficial results to be achieved by crop rotation have been known for thousands of years, the principal advantage from a pathological point of view being the elimination, or reduction, of diseases peculiar to the crop under cultivation. Root diseases such as *Poria*, which bother us at the moment, are a direct legacy from the original jungle, which was planted up immediately after felling, and they have been passed on from bush to bush since that time. Now uprooting of tea is a costly business, and no-one can afford to spend the time, or money required to remove every root. Modern methods of winching leave fewer roots in the soil than does forking out, unless the latter is very closely supervised, and done so carefully as to be uneconomic, but nevertheless there are always sufficient left in to form a focus of infection. We have recently had a very good example of this on St. Coombs new clearing. The majority of this clearing was under Guatemala grass for eighteen months to two years, and then *Tephrosia vogelii* was planted on the contour, followed, when established, by tea. A small block of $\frac{1}{2}$ acre was deliberately planted up within a few months of uprooting the old tea, as soon as some *Tephrosia* had become established. Within a year, in quite a large area of this block the *Tephrosia* plants were dying out with *Poria* infection, and so the whole of this area had to be thoroughly cleared one more, and *Tephrosia* re-established. A careful search in the remainder of the field (some 6 acres) has failed to show any signs of *Poria* root disease, and this in a field which had quite a number of *Poria* patches prior to uprooting. The explanation lies in the fact that the *Poria* fungus has, after two years, exhausted the supplies of food in the small portions of root left in the ground, and although able to travel through the soil from a food-base it is unable to exist on soil alone.

Poria is not the only disease organism capable of leading a saprophytic existence on dead wood, and *Fomes noxius* (Brown Root Disease), *Ustulina* and *Rosellinia*, although unable to make free growth through the soil, can infect young tea by contact. In the event of our ever receiving any encouragement to replant old rubber land in tea a two year fallow will be of equal importance, as three of the troublesome root diseases of rubber, *Fomes*, *Poria* and *Ustulina*, are also able to infect tea.

The order of work then, when replanting, should, in our opinion, be as follows :—

(i) Removal in any case of as much of the root system of tea bushes and rubber stumps as possible.

(ii) Brief examination of all stumps removed, and hand clearance of the roots of any found to be infected by a root disease.

(iii) Planting up of the areas, for two years if possible, with a non susceptible cover. Guatemala grass has proved very effective so far for this purpose, as it also improves the soil conditions, whether this is strictly necessary or not.

(iv) Planting up of a good indicator plant such as Tephrosia before establishing tea. If grass is decided against, this may be used from the beginning of the clearing.

(v) The re-clearance of areas where the Tephrosia dies out, followed by re-seeding, until a clean stand is established.

(vi) Replant with well grown tea plants.

The special case of land infested by eelworm will be dealt with by Mr. Loos.

The other severe scourge of tea, particularly of low-country tea, which may to a great extent be minimised by taking a little thought after replanting, is wood-rot. In a great majority of cases, seen time and time again in young plants, the wood-rot originates at the centering cut, and at the further pruning cuts made when bringing in the bushes. The use of rational methods of bush management in bringing in, stressed so heavily by Mr. Walter in his last conference address, will do much to avoid repeating that picture of decrepitude so common in a great deal of to-day's tea.

There is one other aspect of replanting particularly important from my point of view, which results from the known variation in susceptibility to disease of different tea clones. It is patently impossible to replant entirely with the ideal clone, even if such a thing existed, and so one must be content with a mixture of clones, all, we trust, high yielders, but not all blister resistant, or resistant to other pathogens such as yellow-mite, eelworms etc. which my colleagues will deal with. I am strongly in favour of the block planting of clonal material, say 1-2 acres of each clone, rather than mixed planting, or the planting of a whole field with one clone.

The reason is obvious, and two examples will serve to illustrate this.

With a number of clones which are blister resistant, and a number which are susceptible, mixed planting would entail protection of the whole area, whereas with block planting only those susceptible clones need receive protection. Again, and this is most important, we never know when a new disease may arise, and should one appear that favours a particular clone, limitation of its spread would be much simplified by block planting.

There are several questions which one is often asked about the future of certain diseases. Principal amongst these is blister blight, and I will say, without much fear of being contradicted, that blister blight is here to stay! Again, replanting affords us the opportunity of choosing highly resistant clones for planting up. That these should be tested and approved in the district for which they are intended is most important, as a clone resistant in Calle might not be resistant in Nuwara Eliya. This has just been demonstrated for rubber clones and oidium, and there is no reason why it should not be found to apply to certain tea clones also.

The ultimate perfection in protection from blister blight has by no means been reached as yet, and if one is not replanting resistant material then the opportunity is offered, by replanting, of adopting new field layouts to facilitate the use of any

new (possibly mechanised) equipment, which may be developed. Whether equipment should conform to style of planting adopted, or planting conform to existing equipment, is a matter for future discussion.

There is a popular fallacy at the moment, that either resistant clones will lose their resistance after a while, or that the fungus will increase in virulence. As far as I can say at the moment there is little likelihood of either of these things happening, but a proposed investigation into the life-history of the blister blight fungus may help us to give a more definite answer. The chief reason for belief in this fallacy is complacency, with a consequent falling off in the standard of supervision of protection.

The second question occasionally asked is what is, the future of the phloem necrosis disease, and is it likely to appear in new clearings. Firstly, we believe at the moment that it has little effect on high jat material; so, provided replanting is done with such material, as it should be, there is little chance of its being troublesome. Secondly, as we suspect that it is passed on by root contact and graft of living roots, a year or two of fallow, as already advised, enables root suckers to develop, so that they can be seen, and all living roots capable of passing on infection can then be removed from areas where necrosis was endemic.

One small point about thatching, before I conclude. This is a growing practice, and an extremely sound one, but there have been one or two cases of Rosellinia disease spreading through thatch on new clearings, so I would urge that thatch, particularly when jungle cheddy is used, is confined to the inter row space, and not piled up around the collars of the bushes.

To conclude—the future plans of the Mycology Department will be aimed, as always, at improving disease control, but we cannot too strongly urge that prevention is so much better than cure, and prevention depends to a large extent on early recognition of symptoms by you. So do please make every effort to familiarise yourselves with the symptoms of the commoner pests and diseases, and leave us time to really help you.